

Claims

1. A method of metrologically detecting the differences in the visually perceived color impression between a multi-color patterned surface (10) of a reference and a multi-color patterned surface (12) of a test item, wherein a spatial
5 sensor (24) which detects the surface (12) to be evaluated associated to the test item captures signals and in which by means of the captured signals at least one of the following features is determined, the latter describing the color characteristics of the multi-color patterned surface (12):

- a statistical description of the characteristics of the various colors applied,
- 10 - the geometric distribution of the various colors applied on the surface,
- shape-related features of single-colored elements all pertaining to one respective color of the multi-colored pattern,
- shape-related features of visually distinguishable elements of the multi-colored pattern,

15 characterized in that

concomitantly the picture definition of the pattern is determined by means of the captured signals, the values for the features of the test item which describe the color characteristics are compared with the corresponding predefined values of the reference, the values of the test item which describe the picture definition are
20 compared with the corresponding predefined values of the reference, and that these variations are displayed as separate variation rates for the metrological evaluation of the visually distinguishable differences in the color impression.

2. The method according to claim 1, characterized in that alternatively or in addition to the separate displaying of the variation rates, the variation rates are
25 combined to and displayed as a common variation rate which corresponds to the visual color impression.

3. The method according to claim 2, characterized in that the combination of the measurements detecting the color characteristics with the measurements of the picture definition is effected by a parameterizable mathematical function, preferably by a polynomial, the parameters of which have been experimentally
5 determined.

4. The method according to any one of claims 1 to 3, characterized in that the measured variation rates are compared with tolerance thresholds.

5. The method according to any one of claims 1 to 4, characterized in that the picture definition is determined from the intensity of the signals.

10 6. The method according to any one of claims 1 to 4, characterized in that the picture definition is determined from the saturation of the signals.

7. The method according to any of the preceding claims, characterized in that the spatial sensor is an image rendering color sensor (24).

8. An arrangement for the metrological detection of the differences in the
15 visually perceived color impression between a multi-color patterned surface (10) of a reference and a multi-color patterned surface (12) of a test item, comprising a light source (25) with an essentially constant intensity and spectral distribution for illuminating the multi-color patterned surface (12) of the test item, a spatial sensor (24) for detecting the illuminated surface (12), an arithmetic unit (26) in which
20 metrological values are determined from the signals of the spatial sensor (24), which values describe the color characteristics of the multi-color patterned surface (12),

characterized in that

from the signals of the spatial sensor (24) values are further determined which
25 describe the picture definition of the multi-color patterned surface (12), and that one display unit (32, 48) each is provided for displaying variation rates which are generated by a comparison of the values of the test item which describe the color characteristics with the corresponding predefined values of the reference, as well

as for displaying variation rates which are generated by a comparison of the values of the test item which describe the picture definition with the corresponding predefined values of the reference.

9. The arrangement according to claim 8, characterized in that a conversion
5 unit (40) is provided which converts the signals of the image rendering sensor (24) into intensity signals.

10. The arrangement according to claim 8, characterized in that a conversion unit (40) is provided which converts the signals of the image rendering sensor (24) into saturation signals.

10 11. The arrangement according to any one of claims 8 to 10, characterized in that at least one of the following features, which describe the color characteristics of the multi-color patterned surface (12), is determined:

- a statistical description of the characteristics of the various colors applied,
- the geometric distribution of the various colors applied on the surface,
- 15 - shape-related features of single-colored elements all pertaining to one respective color, of the multi-colored pattern,
- shape-related features of visually distinguishable elements of the multi-colored pattern.

12. The arrangement according to any one of claims 8 to 11, characterized in
20 that the spatial sensor is an image rendering color sensor (24).

13. The arrangement according to any one of claims 8 to 12, characterized in that the light source (25) and the spatial sensor (24) are combined in a measuring head (27).

14. The arrangement according to claim 13, characterized in that the
25 measuring head (27) has calibration means for automatically recalibrating the measuring head (27).

15. The arrangement according to claim 13 or 14, characterized in that, with flat, moved products in form of web, the measuring head (27) is positioned to be so close to the surface (10, 12) that no stray light arrives at the illuminated surface (10, 12), which light comes from the environment and would adulterate the measurement.

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